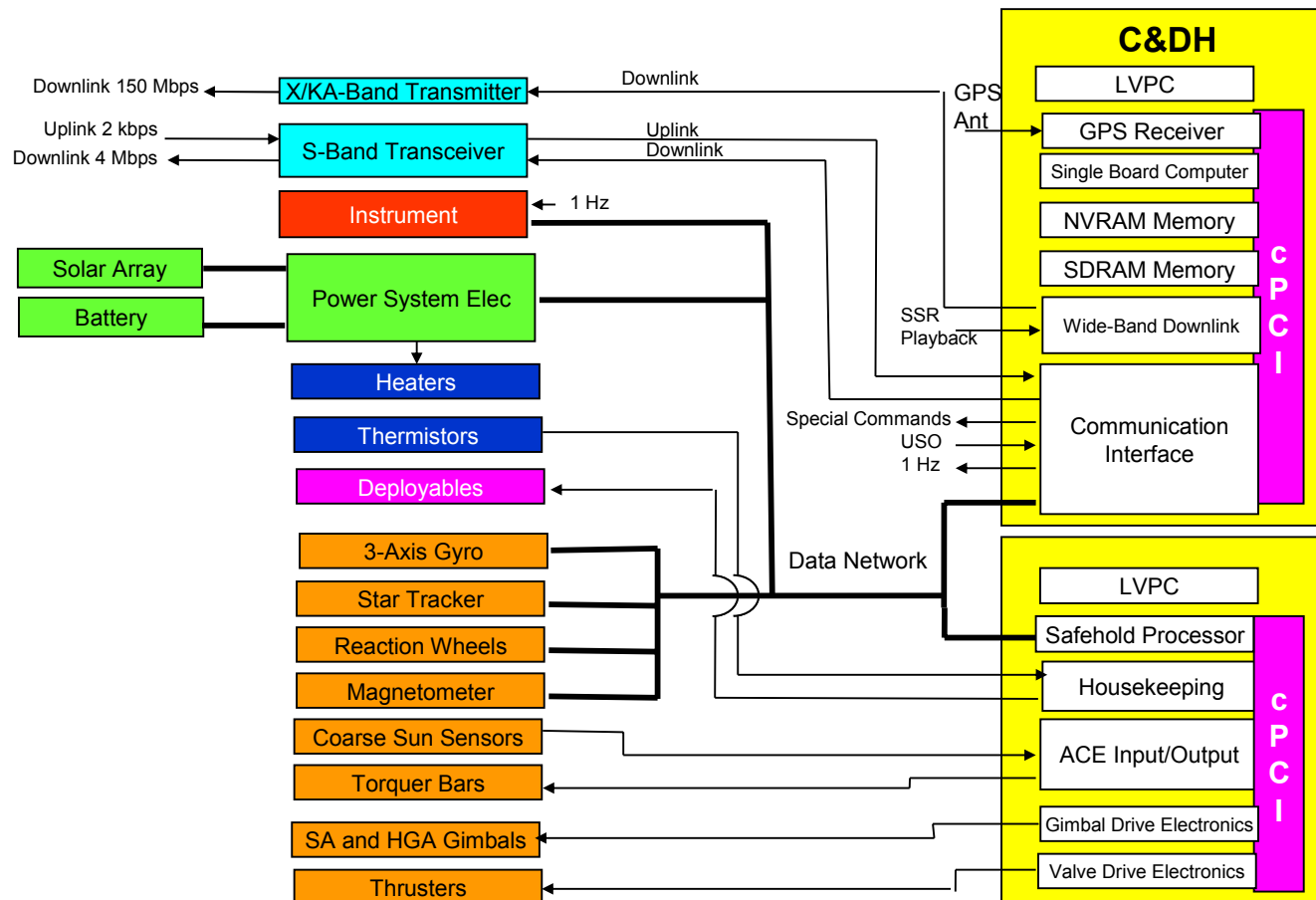# MaRS
Code 582 / Jane Marquart

Objective

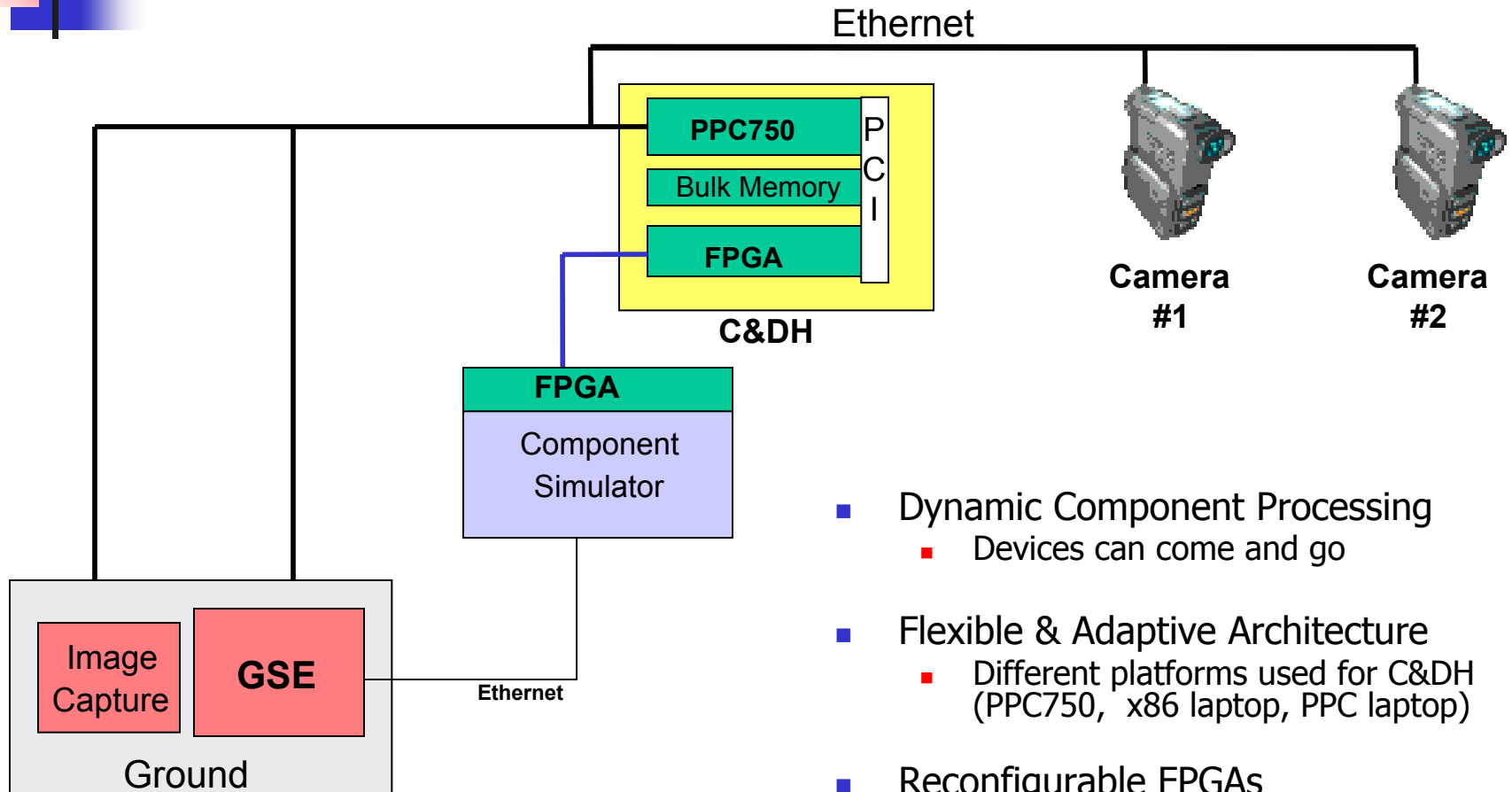**What FSW technologies are conducive to supporting modular, reconfigurable spacecraft?**

- **<u>Component discovery</u>**
  - Allows the addition, removal, or substitution of components to quickly build a new system, quickly change an existing system, or easily upgrade an existing system

- **<u>Layered architecture and standard interfaces</u>**
  - Minimizes the impact of new or modified software components by isolating the extent to which the system is affected by the change

- **<u>Reconfigurable FPGAs</u>**
  - Minimizes software changes by providing a standard means to communicate with different components
    - E.g. Reaction wheels, gyros, thrusters, thermistors

Approach

C&DH Generic Architecture

Approach (continued)

Ethernet

C&DH

PPC750	P
Bulk Memory	C
FPGA	I

FPGA

Component Simulator

Camera #1

Camera #2

Image Capture

GSE

Ethernet

Ground

- Dynamic Component Processing
  - Devices can come and go

- Flexible & Adaptive Architecture
  - Different platforms used for C&DH (PPC750, x86 laptop, PPC laptop)

- Reconfigurable FPGAs
  - Standard I/F to different types of H/W components, i.e. thermistors, gyros

Future Work

- Further investigation into Universal Plug and Play
- Adoption of XML
  - Device interface description
  - Data formats
- Expansion of layered architecture concepts to other subsystems